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117

| APPLICATION NO.   | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO.       | CONFIRMATION NO.       |
|---|-------------|----------------------|---------------------------|------------------------|
| 10/800,450  | 03/15/2004  | Emmanuel Hadji       | 33019US1                  | 1230                   |
| 116   | 7590        | 07/19/2007           |                           |                        |
| PEARNE & GORDON LLP<br>1801 EAST 9TH STREET<br>SUITE 1200<br>CLEVELAND, OH 44114-3108 |             |                      | EXAMINER<br>LUU, CHUONG A |                        |
|   |             |                      | ART UNIT<br>2818          | PAPER NUMBER           |
|   |             |                      | MAIL DATE<br>07/19/2007   | DELIVERY MODE<br>PAPER |

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

24

|                              |                               |                              |  |
|------------------------------|-------------------------------|------------------------------|--|
| <b>Office Action Summary</b> | Application No.<br>10/800,450 | Applicant(s)<br>HADJI ET AL. |  |
|                              | Examiner<br>Chuong A. Luu     | Art Unit<br>2818             |  |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 03 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 05 August 2005.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-15 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-15 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Response to Arguments***

Applicant's arguments with respect to claims 1-15 have been considered but are moot in view of the new ground(s) of rejection.

## **PRIOR ART REJECTION**

### **Statutory Basis**

#### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

### **The Rejections**

Claims 1-2 and 4 are rejected under 35 U.S.C. 102(e) as being anticipated by Biasse et al (5,993,677).

Biasse discloses a semiconductor device with

(1) a) Molecular bonding of a silicon block (120) on the support on which there may or may not already be other layers, the silicon block having a surface layer (124), delimited by a cleavage area (126) substantially parallel to its surface, and with a thickness greater than or respectively less than the said determined thickness, and the

silicon block being covered by a silicon oxide layer (112) brought into contact with the support during bonding (see column 3, lines 14-17 and column 4, lines 38-54),

b) cleavage of the silicon block along the cleavage area to detach the surface layer fixed to the support from it (see column 4, lines 55-62. Figures 9-10);

c) thinning or respectively thickening said surface layer until a thickness substantially equal to the said determined thickness, is obtained (see column 5, lines 9-11);

(2) in which the thickness of the surface layer of the silicon block used in step a) greater than the determined thickness, and in which thinning of the surface layer in step c) comprises at least one oxidation operation followed by at least one etching operation and/or one polishing operation;

(4) in which a hydrogen implantation is performed before step a) through one of the faces (23) of the silicon block to form an embrittled area in the block, said embrittled area extending substantially along a plan parallel to the surface of said block and forming the cleavage area, the implantation energy being adjusted to form the cleavage area at a depth which is greater than or respectively less than the determined thickness (see column 3, lines 18-23).

## **PRIOR ART REJECTION**

### **Statutory Basis**

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

### **The Rejections**

Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Biasse et al (5,993,677) in view of Ohmura et al. (4,848,272).

Biasse teaches the outlined features above but fail to disclose to increase the thickness by crystalline growth. However, Ohmura teaches that crystalline growth is conventional to provide a high quality thin film having uniform thickness over a semiconductor substrate (see column 1, lines 10-14 and column 2, lines 3-7). It would have been obvious to one skilled in the art to increase the thickness if the thickness is less than the predetermined thickness and furthermore, crystalline growth is conventional technique to form an epitaxial layer on a silicon substrate as supported by Ohmura. Doing so would facilitate the manufacture of the semiconductor device and improve the productivity of a semiconductor structure.

Claims 5-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Biasse et al (5,993,677) in view of Ramdani et al (5,835,521).

Biasse teaches the above outlined features except for a bragg mirror structure including alternating layers of silicon oxide and a silicon material utilizing epitaxial

growth technique and /or wafer bonding; silicon oxide layer is formed by standard epitaxial growth technique including CVD or PECVD technique; an optical component is formed by fabricating a vertical cavity surface emitting laser or active region on the bragg mirror and also teach that a second mirror is disposed over the active region. However, Ramdani et al disclose a bragg mirror structure (10) including alternating layers of silicon oxide and a silicon material utilizing epitaxial growth technique and /or wafer bonding, wherein the alternating silicon oxide and silicon layers inherently includes the optical property such as the optical thickness of the alternating layers (see column 3, lines 17-25); said silicon oxide layer is formed by standard epitaxial growth technique including CVD or PECVD technique (see column 3, lines 18-25); an optical component is formed by fabricating a vertical cavity surface emitting laser or active region on the bragg mirror (see column 3, lines 9-55); a second mirror (42) is disposed over the active region (see column 6, lines 4-24); the formation of silicon layer as bonding a silicon block with a support, cleaving the silicon block and thinning the surface layer to a desired thickness. It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the teaching of Biasse (in accordance with the teaching Ramdani). Doing so would facilitate the manufacture of the semiconductor device and enhance the speed of the semiconductor structure.

***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Chuong A. Luu whose telephone number is (571) 272-1902. The examiner can normally be reached on M-F (6:15-2:45).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David C. Nelms can be reached on (571) 272-1787. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Chuong Anh Luu  
Patent Examiner  
October 20, 2005